RELATÓRIOS COPPEAD

427

Junho 2016

AGENCY CONFLICTS, COMPENSATION AND CLIENTELE TYPE, AND SURVIVORSHIP BIAS IN BRAZILIAN STOCK FUNDS

Flávio C. Sanematsu
Ricardo P. C. Leal

Relatórios COPPEAD é uma publicação do Instituto COPPEAD de Administração da Universidade Federal do Rio de Janeiro (UFRJ)

Editora
Leticia Casotti

Editoração
Lucilia Silva

Ficha catalográfica
Cláudia de Gois dos Santos

Sanematsu, Flávio C.

Agency conflicts, compensation and clientele type, and survivorship bias in Brazilian stock funds. / Flávio C. Sanematsu, Ricardo P. C. Leal. – Rio de Janeiro: UFRJ/COPPEAD, 2016.

29 p.; 27 cm. – (Relatórios COPPEAD; 427)

ISBN 978-85-7508-114-3
ISSN 1518-3335

1. Finanças. 2. Investimentos. 3. Fundos de ações-Brasil. I. Ricardo P. C. Leal. II. Título. III. Série.

CDD: 332.6

AGENCY CONFLICTS, COMPENSATION AND CLIENTELE TYPE, AND SURVIVORSHIP BIAS IN BRAZILIAN STOCK FUNDS

Flávio C. Sanematsu [1]
Ricardo P. C. Leal [2]

ABSTRACT

This article investigates the survivorship bias and the behavior of equity mutual funds at calendar semester ends in Brazil between 2004 and 2013. Results indicate that fund performance is associated with its survivorship, but other factors may play an important role in keeping a fund in activity. Results also suggest that the sampled funds present positive abnormal returns on the last trading day of calendar semesters, followed by negative abnormal returns on the subsequent day. Funds oriented to retail investors and those that charge incentive fees are more likely to display these abnormal return behavior. There seems to be evidence of portfolio pumping.

Keywords: agency conflicts, survivorship bias, portfolio pumping, equity mutual funds, Brazil

RESUMO

Este artigo investiga o viés de sobrevivência e o comportamento de fundos de investimento em ações (FIA) ao final dos semestres do ano calendário no Brasil entre 2004 e 2013. Os resultados indicam que o desempenho dos FIA está associado com sua sobrevivência, mas que outros fatores podem ter papel importante para manter um FIA em atividade. Os resultados também sugerem que os FIA da amostra apresentam retornos anormais positivos no último dia de negociações dos semestres do ano calendário, seguidos de retornos anormais negativos no dia de negociações seguinte. FIA voltados para clientes de varejo e os que cobram taxa de performance apresentam maior probabilidade de exibir este padrão de retornos anormais. Parece haver evidência de 'portfolio pumping'.

Palavras-chave: conflitos de agência; viés de sobrevivência, 'portfolio pumping', fundos de investimento em ações, Brasil

---

[1] Brazilian Economic and Social National Development Bank (BNDES). D. Sc. in Business Administration, The COPPEAD Graduate School of Business at the Federal University of Rio de Janeiro. E-mail: flavio.sanematsu@gmail.com

[2] Professor of Finance, The COPPEAD Graduate School of Business at the Federal University of Rio de Janeiro. E-mail: ricardoleal@coppead.ufrj.br

1 – INTRODUCTION

This article investigates potential conflicts of interest in actively managed Brazilian stock funds. Its data ranges from January 2004 through February 2013. It considers discontinued and funds in operation at the end of the sample period to assess the impact of survivorship bias. This study discarded very small funds. These are departures from Sanematsu (2013) that also studied agency conflicts in Brazilian stock mutual funds.

Carhart *et al*. (2002) reveal US evidence that managers may try to inflate fund share prices to increase their compensation or attract new capital with an improved performance. This fund share price inflation, if carried out with the sole motivation of maximizing the wealth of managers, instead of trying to maximize the wealth of investors, constitutes a conflict of interest. Investors bear the costs of these deleterious transactions, incur a permanent wealth transfer to managers in the form of inflated fees, and may hold a portfolio that includes assets that are easier to manipulate instead of more desirable qualities. It is possible that managers only resort to these actions when performance has been poor.

Sanematsu (2013) revealed Brazilian evidence about possible stock fund share price manipulation through positive abnormal returns on the last day of calendar months, especially at the end of calendar semesters, with a reversal on the following day. Fees are commonly charged on the last day of calendar periods in Brazil, mainly at the end of calendar semesters. Investors look at performance information for the end of calendar periods, with a special interest on the previous full calendar year as well as year-to-date performances at the end of each calendar month. Thus, these actions, if present, may help boost performance in the short-term to possibly attract more capital.

This study examines abnormal returns at the end of calendar semesters, but considers the last trading day of calendar months as well. Even though incentive fees are commonly charged at the end of calendar semesters, this study also considers the actual dates funds charge incentive fees for the funds that use other dates. Moreover, to assess inflation transaction reversals, the days following the last trading days of calendar periods, or the days of actual incentive fee charges, are also investigated.

The analysis herein differentiates funds according to survivorship, clientele, and fees. A conjecture is that abnormal returns on the last trading day of calendar periods may be more pronounced for discontinued funds because their managers may attempt to artificially boost performance and mimic successful funds during the difficult times before the fund terminates.

Clientele types include exclusive and non-exclusive funds. Non-exclusive funds are categorized as those that target qualified investors or the general public. The explicit consideration of exclusive funds is another departure from Sanematsu (2013). It is reasonable to assume that exclusive fund investors are more engaged in monitoring fund managers and may replace them more easily. This is probably not so for funds targeting the general public. Non-exclusive funds targeting qualified investors are possibly and intermediate situation.

Fee types consist of funds that solely charge management fees, those that charge incentive and management fees, and those that do not charge fees (a small portion of the sample, mostly exclusive funds). A conjecture is that conflicts of interest, and fund share price inflation, could be more severe among funds that charge incentive fees. This study also verifies abnormal returns on the end of calendar period for combinations of these categories.

The mark-to-market procedure changed in May 2008 with the introduction of a new rule by the Brazilian Securities Commission. Funds used a weighted average price but the new rule mandated the use of the closing price. It is possible that evidence of fund price share inflation changes in intensity before and after the introduction of the new rule. A conjecture is that closing prices may be easier to manipulate and that fund share price inflation may be more severe after the introduction of the new rule.

Results confirm that abnormal returns are frequently positive and significant on the last trading day of calendar periods. This is more often observed on the days funds charge fees. The evidence also suggests that abnormal returns are frequently negative and significant on the days following these last trading days, with a larger absolute value than the positive abnormal returns. Thus, investor losses are not negligible. This effect is more pronounced for funds that charge incentive fees and target the general public. The introduction of the new mark-to-market rule may have accentuated price inflation effects. Discontinued funds do not present a behavior pattern remarkably different from surviving funds, but their average annual returns are lower, evince that considering survivorship bias is important.

This article continues with a short literature review section, followed by the description of the sample, the discussion of the results, and conclusions.

2 – LITERATURE REVIEW

2.1 Survivorship bias

Elton, Gruber, and Blake (1996) examined what happens to all funds that existed from a specific time onwards. The authors analyze US equity mutual funds in existence in 1976 and follow their performance until the end of 1993. Funds may remain in operation, terminate and return its assets to investors, or be absorbed into another fund. They gather that absorbed funds are weak performers.

Malkiel (1995) used a US sample containing all stock mutual funds in existence during the 1971-1991 period. The average fund return was less than that of the main stock indices, even when considering returns before all expenses, such as transaction costs and management fees. The author also found that funds in continuous operation from 1982 to 1991 exhibited average annual returns greater than those of all funds that operated during the same period. Even so, funds in operation during the whole period underperformed the S&P500. Using year-by-year data, Malkiel (1995) found that the average annual returns of funds that remained in operation throughout the 1982-1991 period is statistically greater than those of discontinued funds in the same period.

Brown and Goetzmann (1995) indicate that an inferior performance relative to the S&P500 increases the probability that a fund will cease operations. They analyzed US stock mutual funds during the 1976-1988 period and included discontinued fund data in their sample. Their evidence conveys that funds in continuous operation throughout the whole sample period displayed greater average annual returns than discontinued ones. This difference is more accentuated for smaller funds. Thus, they conclude that smaller funds with a weak performance are more likely to be discontinued or absorbed into other funds. Brown and Goetzmann (1995) also conjecture that weak performance is the main fund discontinuation predictor, and add that larger and older funds are less likely to terminate. The inflow of new money also reduces the probability that the fund will end, but to a lesser extent.

2.2 Conflicts of interest

Carhart *et al*. (2002) detected that US equity mutual fund managers execute more trades during the last minutes of the trading session at quarter and year-ends in order to influence the closing price on these dates. Performance and compensation are calculated with these prices. The authors point out that stock funds exhibit very high and economically and statistically significant abnormal returns on the final trading day of a quarter and year.

Moreover, abnormal returns on the following day are very low, suggesting the reversal of inflated returns.

Carhart *et al*. (2002) use calendar dummies for the last trading day of each month, quarter and year in their sample and also for the corresponding following day as explanatory variables. They build equally weighed portfolios of stock funds and the dependent variable is their abnormal return. Results indicate that stock fund portfolios exhibit price inflation at quarter and year-ends, while this effect is small or non-existent at month-ends. They replace abnormal return of the stock fund portfolio with the proportion of funds that exhibit a positive abnormal return and reveal that the proportion of funds with an abnormal positive return at year-ends is greater than at the end of other quarters, indicating that the practice of inflating the stock fund price, especially at the end of the year, is very common among US stock mutual funds.

Portfolio pumping is the practice of trying to inflate the price of assets in which funds are already overweight. It differs from window dressing because this later practice aims to rid funds of losing stocks and buy winners in order to display an end of the period portfolio populated with winners. This would lead to a downward price-pressure on losers and an upward pressure on winners. Portfolio pumping creates only an upward price-pressure, and not necessarily on winning stocks.

There is evidence of portfolio pumping in the US and Australia. Gallagher *et al*. (2009) assert that institutional fund managers usually buy less liquid and small capitalization stocks, in which they are already overweight, on the last day of the quarter. These stocks exhibit positive abnormal returns on this day, consequently improving fund performance. Carhart *et al*. (2002) also found signs that some stock funds manipulate the price of stocks they already hold. Similarly to Carhart *et al*. (2002), Gallagher *et al*. (2009) also reveal that the average daily returns of Australian stock funds on the last day of the quarter are greater than those of benchmark indices, indicating that these funds invest more than the average investor in stocks whose price is inflated on the final trading day of the quarter.

The dynamics of the risk profile of stock fund portfolios during the calendar year may also suggest conflicts of interest issues. Huang *et al*. (2011) analyze the performance of US mutual funds that exhibit changes in their levels of risk over time. They compare the volatility based on the portfolio positions published at quarter-ends to the realized volatility of the stock fund returns. The former would be the volatility of the fund if the manager had maintained the positions disclosed at the end of the quarter. The latter is the volatility that the investors in the fund actually experienced. Their evidence indicates that these two

volatility estimates are different and that fund managers change volatility levels at quarter-ends.

Comerton-Forde and Putnins (2011) survey information regarding price manipulation lawsuits in the US and Canada. They conclude that, even though manipulation lasts only for a short period of time, prices may move very far from their ideal levels, which may have detrimental effects on market participants. Grinblatt and Titman (1989) point out that a change in the level of risk assumed by a fund may be indicative of agency problems. Risk may change due to ill-motivated trades to increase management compensation. Alternatively, managers may be motivated to change the risk profile of their portfolios to take advantage of the convex relationship between performance and fund flows. Funds that exhibit a superior performance receive proportionally larger inflows than those that register an inferior performance. This convex relationship may create incentives for managers to increase the risk levels of portfolios in order to achieve a superior performance.

The findings of Huang *et al*. (2011) indicate that funds change their risk level significantly over time and the performance of those that promote more changes is worse than those that keep risk levels stable. Thus, investors may obtain larger returns by investing in the latter. These authors claim that changes in the risk level of funds are probably indicative of agency problems. Brown *et al*. (1996), in an earlier investigation, indicate that "looser" funds, especially the younger ones, increase their risk level in the middle of the year. The authors believe that the growth of the mutual fund industry during the final period of their sample (1976-1991), allied with the greater scrutiny exercised by investors over the past performance of funds, may be responsible for the willingness of managers to assume riskier positions when their performance is relatively inferior. Warner and Wu (2011) reveal that more mutual fund board independence is associated with fewer increases and more reductions in the compensation of managers. A possible way of mitigating this problem would be to appoint a larger number of independent directors.

Castro and Minardi (2009) analyze Brazilian actively and passively managed stock mutual funds between January 1996 and October 2006. They examined the returns to investors, which are net of fees, and an estimate of gross returns, calculated as the return to investors plus the management fee. The authors did not put back incentive fees charged by some funds. Even so, their evidence indicates that positive and significant alphas are more frequent when they use gross returns instead of net returns to investors and more frequent than negative alphas, which was not case when they used net returns to investors. The authors conclude that managers appropriate a considerable part of the gains due to their superior skills.

Sanematsu (2013) analyzes Brazilian stock mutual fund data between 2004 and February 2012, but uses a sample that is not free of survivorship bias. He used the Carhart *et al*. (2002) method. The funds exhibit positive abnormal returns at semester-ends followed by a reversal on the next day. Funds that target qualified investors are less likely to exhibit these abnormal returns than those aimed at the general public. He also grouped funds according to charging or not an incentive fee, but the evidence about abnormal returns was not as clear as with the type of clientele. The author concludes that there is evidence suggesting fund share price manipulation, especially when fees are charged. They suggest that there should be stricter rules governing the charge of incentive fees in funds targeting the general public. Roquete *et al*. (2016) applied the same method of Sanematsu (2013) to Brazilian multimarket funds, roughly equivalent in many cases to US hedge funds, and found similar results for some strategy categories.

Brazil changed its mark-to-market rule in May 2008. Funds have to use the closing price from this date forward, instead of the trade volume weighted average price used until then. Sanematsu (2013) affirms that this change may have accentuated the problem of abnormal returns at semester-ends. Gallagher *et al*. (2009) studied changes in the closing price methodology at the Australia Securities Exchange (ASX). ASX adopted a discrete auction model in February 1997 to determine the closing price due to possible manipulations. A new closing price methodology was introduced again in 2001 after new allegations of price manipulation. The authors claim that the introduction of auctions reduced the possibility of manipulating closing prices because price volatility at market closure was decreased. However, the probability of temporarily inflating prices was not totally eliminated.

3 – SAMPLE

The sample includes stock mutual funds in existence from January 2004 through February 2013. The data covers funds still operating in February 2013 and those discontinued during the sample period and comes from the Quantum Axis® database. Information about discontinued funds was kindly provided for this study. The fund sample includes only those classified as actively managed, eliminating sector, private equity, index, and exchange traded funds. The sample does not include funds, in operation or discontinued, with a track record shorter than 12 contiguous months of returns.

The same database provides the type of fees and target clientele for funds in operation only. Funds are classified in three fee categories: those that charge solely a management fee; those that levy management and incentive fees; and those that do not

charge a fee. Master funds comprise 75 of the 85 funds that do not charge fees. Managers use master funds to receive investments from funds of funds (FoF) or feeder funds, which charge fees. The study includes master funds in the sample because fund managers use them to trade stocks and abnormal returns may occur. Seven of the remaining ten funds that do not charge fees are exclusive funds and the other three target institutional investors. The classification according to the type of target clientele is: exclusive funds; non-exclusive funds for qualified investors; and non-exclusive funds available to the general public. These classifications are based on fund information at the time of data collection (April 2013). Sanematsu (2013) did not discern between exclusive and non-exclusive funds and between funds that charge and do not charge fees.

The sample only includes funds with a minimum average value for the daily assets under management (AUM) of R$10 million (about US$ 5 million) in at least one of the calendar quarters in the sample period. This exclusion eliminated very small funds whose behavior may differ from the most representative portion of the Brazilian mutual fund industry. This is a departure from Sanematsu (2013), who did not filter out the smaller funds. Nonetheless, the sample still covered around 99 percent of the AUM of all initially selected funds. The initial sample of 1119 stock funds in operation or discontinued in February 2013 decreased to 850 after the minimum AUM filter and finally to 608 funds after the application of the contiguous 12 months of returns and active management filters.

Table 1 presents the number of funds and AUM for each year according to the survivorship, fee and clientele classifications. The number and the AUM of stock funds increased almost seven and nine times, respectively, in the sample period. The number of discontinued funds was larger between 2007 and 2010. Contrastingly, the number of funds increased more rapidly in this same period, suggesting a dynamic environment in the industry in a period of strong economic growth in Brazil (4.6 percent average gross domestic product growth between 2007 and 2010 according to World Bank data).

Forty-two percent of the funds in operation in February 2013 were exclusive, 18 percent targeted qualified investors but were not exclusive, and 40 percent aimed at the general public. The proportion of total AUM of funds for qualified investors seem to have increased while it decreased for those targeting the general public and remained about the same for exclusive funds. Fifty-two percent of funds charge solely a management fee, 34 percent also add an incentive fee, and 14 percent do not charge fees. The proportion of funds charging solely the management fee is stable in the period, hovering around 54 percent according to the number of funds, but decreased to about 47 percent according to the AUM.

Table 1 – Number of stock funds and assets under management (AUM)

Panel A: According to survivorship

	In operation		Discontinued		All funds	
Year	No.	AUM	No.	AUM	No.	AUM
2004	78	10.7	80	4.2	158	14.9
2005	92	12.5	79	4.6	171	17.1
2006	116	19.2	79	7.2	195	26.5
2007	159	37.6	90	10.1	249	47.8
2008	221	26.6	95	5.6	316	32.2
2009	310	48.5	89	6.4	399	54.9
2010	388	63.0	99	7.7	487	70.8
2011	494	64.7	83	5.2	577	69.9
2012	585	92.6	20	0.8	605	93.4
Feb/2013	598	96.3	10	0.3	608	96.5

Panel B: According to clientele, funds in operation in February 2013

	Exclusive		Qualified		General Public	
Year	No.	AUM	No.	AUM	No.	AUM
2004	11	5.1	9	0.9	58	4.7
2005	15	6.4	10	1.3	67	4.8
2006	26	9.7	14	2.1	76	7.5
2007	48	15.1	23	5.1	88	17.4
2008	82	13.7	35	3.8	104	9.1
2009	126	23.1	46	7.2	138	18.1
2010	169	29.7	57	12.3	162	21.0
2011	206	32.3	81	12.9	207	19.5
2012	244	44.3	103	19.4	238	28.9
Feb/2013	249	44.7	108	20.1	241	31.5

Panel C: According to compensation fees, funds in operation in February 2013

	Management fee only		Management and Incentive Fees		No Fees	
Year	No	AUM	No	AUM	No	AUM
2004	40	6.0	27	2.6	11	2.2
2005	49	7.2	32	2.6	11	2.6
2006	61	11.6	42	3.8	13	3.9
2007	85	21.9	60	7.6	14	8.1
2008	125	14.0	77	4.6	19	8.0
2009	168	25.8	112	9.4	30	13.3
2010	210	32.8	132	12.0	46	18.2
2011	262	30.5	165	12.5	67	21.7
2012	305	44.0	196	17.8	84	30.8
Feb/2013	310	45.3	203	18.4	85	32.5

Note. The data are for the end of each. AUM are in R$ billion. The table includes only actively managed funds with average daily AUM greater than R$ 10 million in any calendar quarter and with a minimum of 12 contiguous months of returns in the sample period. Exclusive funds are for qualified investors but "qualified" funds are not exclusive. Ten of the 608 sampled funds (1.6% of the total) in February 2013 were discontinued between February 2013 – the last date considered for the sample period – and April 2013, when data was collected.

4 – RESULTS

4.1 Survivorship bias

The survivorship analysis includes all stock mutual funds that were in operation during the sample period for at least 12 contiguous months. It does not provide information about clientele and fee types because it was no longer available for discontinued funds in the Quantum Axis® database. Table 2 shows annualized equally and AUM weighted average returns. Malkiel (1995) offer results solely for value weighted returns, whereas Brown and Goetzmann (1995) use both. Table 2 also displays average annual returns with and without the minimum AUM filter, which excludes the very small funds. Table 3 shows statistical tests comparing the average returns achieved by different groups of funds in each year.

Table 2 shows that the average returns for funds in operation at the end of the sample period (new and surviving funds) were greater than those of all funds (including those discontinued). Interestingly, funds that survived during the entire sample period display a smaller equally weighted annualized return than all funds, but this does not happen for the value weighted annualized return. This suggests an overestimation of performance if discontinued funds are not considered. Moreover, the smaller funds, particularly if filter for the very small ones in not applied, contribute to the lower return of the survivor group. Only the new and surviving funds generate an average return greater than the one registered by the IBrX index.

Table 2 also suggests that including the funds initiated during the sample period increases average returns. This is consistent with Brazilian results in Mendonça Jr., Campani, and Leal (2016) and Matos, Pena, and Silva (2015) that associate younger funds to greater returns. Malkiel (1995), contrastingly, found that the value weighted average annual return of all funds in his US sample was lower than that of funds in operation during the whole period studied. It is possible that funds created during the sample period in Brazil initiated operations at a favorable economic and stock market environment, as pointed out earlier in this article and by Mendonça Jr. *et al*. (2016) as well. Thus, these new funds may be driving the results in Table 2, despite the possible negative drag of the smaller funds.

Table 2 – Average annual returns

	All funds	Survivors	New and survivors	Ibovespa	IBrX
Any AUM:					
EW	16.18	15.81	18.57		
VW	17.08	17.05	18.19	13.82	17.66
Min. AUM					
EW	17.80	16.47	19.62		
VW	17.14	17.07	18.22		

Note. Annual percentage returns are expressed in nominal Brazilian currency terms. The sample period ranges from January 2004 through February 2013. "All funds" includes operating and discontinued stock funds with at least a one-year track record. "Survivors" includes only funds in operation throughout the entire sample period. "New and survivors" includes only funds in operation at the end of the sample period with at least a one-year track record. The minimum size rule selected funds with AUM greater than R$10 million (about US$ 5 million) in at least one quarter during the sample period. Ibovespa and IBrX are two widely followed stock indices in Brazil. T-tests comparing results found for the different groups for each year are presented in Table 3.

Table 3 presents average annual returns in each year of the sample period and disregards very small funds. Malkiel (1995) finds that the average return of the surviving funds is significantly greater than those recorded by non-survivors in all years of his sample. Average returns of funds in operation at the end of the sample period (Panel A) are greater than those of discontinued funds (Panel B) for every year, except 2008, with significance in 6 out of the 9 years. This confirms that the larger annualized returns of funds in operation in Table 2 are often significantly larger than discontinued ones. Panel C of Table 3 shows a comparison of the average returns of funds that survive until the end of the sample period with that of discontinued funds in each year. The average annual returns of surviving funds are greater than those of discontinued funds in the following year in all years, with the exception of 2008, with significance in 5 out of the 9 years. The results in Panel C are similar to those depicted in Panel B, which shows the differences for funds discontinued at any moment in time.

The Brazilian stock fund mortality rates in Table 3 are greater than those in the US sample of stock funds in Malkiel (1995). US stock fund mortality rates varied from five to 18 percent, depending on the year. Panel B of Table 3 shows mortality rates between 14 and 51 percent after disregarding 2012 because the 2013 data did not cover the whole year. The mortality rate of a fund in the year following the period analyzed is approximately 9% in Panel C of Table 3. Maybe the more volatile nature of the Brazilian stock market and economy induces a greater dynamic in the fund industry.

Table 3 – Average annual returns by year and survivorship

Panel A: Survivorship by year

	All funds		New and survivors	
Year	Average return	No. of funds	Average return	No. of funds
2004	30.8	158	36.6	78
2005	25.9	171	26.3	92
2006	34.8	195	38.6	116
2007	40.1	249	42.9	159
2008	-38.0	316	-40.1	221
2009	82.5	399	84.7	310
2010	8.5	487	10.1	388
2011	-10.8	577	-10.2	494
2012	17.6	605	17.8	585

Panel B: Funds not surviving until February 2013

Year	Average return	No. of funds	Mortality rate	t-test
2004	25.0	80	50.6	4.69*
2005	25.5	79	46.2	0.46
2006	29.2	79	40.5	4.11*
2007	35.1	90	36.1	2.56*
2008	-33.2	95	30.1	-1.76
2009	74.6	89	22.3	2.80*
2010	1.9	99	20.3	5.22*
2011	-14.2	83	14.4	2.97*
2012	14.3	20	3.3	0.86

Panel C: Funds discontinued in the following year

Year	Average return	No. of funds	Mortality rate	t-test
2004	20.7	13	8.2	4.24*
2005	21.5	19	11.1	1.52
2006	25.1	24	12.3	3.22*
2007	29.0	28	11.2	3.41*
2008	-19.9	28	8.9	-1.67
2009	70.5	11	2.8	1.03
2010	-1.3	40	8.2	4.56*
2011	-15.0	69	12.0	3.42*
2012	14.3	20	3.3	1.21

Note. Average returns in percentage form in nominal Brazilian currency terms. All funds include those with at least a one-year track record. New and survivor funds in Panel A includes those that remained in operation until the end of the sample period, even if they initiated during it. Funds not surviving until Feb/2013 includes those that were discontinued after the year under analysis (i.e., 2006 values consider funds discontinued as from 2007). Funds discontinued in the following year include only those discontinued in the year after the year under analysis (i.e., 2006 values consider only funds discontinued during 2007). Mortality rate calculates the proportion of funds discontinued in relation to stock funds in existence in that year. The t-tests compare the average return of funds that survive until the end of the sample period in Panel A with the average return of discontinued funds in Panels B and C. * indicates significance at the 5 percent level.

4.2 Performance, fees, and clientele

Table 4 presents average annual returns of funds in operation because there was no information available for fees and clientele types for discontinued funds. There is virtually no significant difference among fund categories in the table in the 2004 through 2012 period. The average cumulative return for non-exclusive funds targeting qualified investors was 525% and is much higher than that of the other clientele categories. It is not surprising that funds that do not charge fees display a much higher cumulative return than those that do because reported fund returns are net of fees. The returns of the Ibovespa and IBrX indices were 174% and 265%, respectively, during the same period.

Institutions that specialize in asset management and run most US stock funds are usually not associated to commercial banks (MALKIEL, 1995). In Brazil, contrastingly, there is a mix of asset managers that are either independent or are associated to large financial conglomerates with a commercial bank at its center. Many stock funds targeting the general public belong in this category. Mendonça Jr. *et al*. (2016) indicate that returns tend to be lower for funds managed by these latter asset managers, which corresponds to the evidence in Table 4, albeit a lack of significance on a year-by-year basis.

Table 4 – Average annual returns according the fee and clientele categories

Panel A: According to the clientele

	Exclusive funds		Qualified investor funds		General public funds	
Year	Average return (A)	t-test (A) - (B)	Average return (B)	t-test (B) - (C)	Average return (C)	t-test (A) - (C)
2004	42.3	0.1	39.7	0.3	35.0	0.5
2005	22.0	-1.0	35.4	0.8	25.9	-0.5
2006	37.9	-0.2	40.9	0.2	38.3	0.0
2007	39.3	-0.9	55.4	0.8	41.6	-0.3
2008	-36.4	0.1	-37.6	0.8	-43.8	1.2
2009	79.8	-0.5	87.4	-0.1	88.2	-0.8
2010	10.2	-1.4	16.5	1.9	7.8	1.3
2011	-8.6	0.0	-8.7	1.8	-12.4	2.5*
2012	16.6	-1.5	21.3	1.1	17.7	-0.5
2004-12	348	–	525	–	292	–

Panel B: According to fee types

	Management fee only		Management and incentive fees		No fees	
Year	Average return (A)	t-test (A) - (B)	Average return (B)	t-test (B) - (C)	Average return (C)	t-test (A) - (C)
2004	34.7	-0.4	38.6	0.0	38.6	-0.2
2005	29.1	1.0	22.8	-0.2	24.5	0.5
2006	36.1	-0.6	41.6	0.1	40.2	-0.3
2007	40.4	-0.7	46.2	0.1	44.3	-0.3
2008	-41.1	0.0	-41.0	-1.1	-29.9	-1.2
2009	81.4	-0.8	90.0	0.3	83.6	-0.1
2010	8.2	-1.7	11.8	-0.7	14.1	-1.8
2011	-10.7	0.0	-10.8	-1.9	-6.7	-2.0*
2012	17.9	0.6	16.6	-1.2	20.5	-0.8
2004-12	305	–	359	–	476	–

Note. Average returns in percentage form in nominal Brazilian currency terms. Discontinued funds are not included in this table because there was no fee and clientele information for them. The 2004-12 value is the cumulative average return in the period. The returns of the Ibovespa and IBrX indices were 174% and 265%, respectively, in the period. Exclusive funds are for qualified investors but qualified investor funds are not exclusive. The t-tests compare the average returns in two table columns, as indicated. * indicates significance at the five percent level.

4.3 Abnormal returns and survivorship

An abnormal daily return is the excess return relative to the Ibovespa stock index, which is the main benchmark of the Brazilian stock market. The empirical exercises in this section were also carried out for the IBrX index, with no change in conclusions. These additional tests are available upon request but are not reported.

The empirical tests follow the format in Carhart *et al*. (2002). The abnormal daily returns of stock fund portfolios are evaluated on the last day of calendar periods and on the day following it, to assess possible reversals. However, instead of building fund

portfolios based on styles, this study forms fund portfolios according to survivorship and clientele and fee types. Stock fund portfolios did not include very small AUM funds and are equally and AUM value weighted.

The abnormal daily return is the dependent variable. The explanatory variables are dummies marking the beginning and end of calendar months or semesters, as described in the Appendix. Table 5 displays the results for abnormal returns relative to the Ibovespa index for the equally weighted stock fund portfolios. The evidence for the value-weighted stock fund portfolios is very similar but important contrasts are highlighted whenever necessary. The complete results are available with the authors.

The first model in Table 5 verifies if the first and last trading day of any month exhibit abnormal returns. The second model considers only the first and last trading day of a semester, without distinguishing between semesters. The third model distinguishes between the first and second semesters, as well as the months that do not coincide with semester beginning and end dates. Other models have been tested that distinguished between the first and second semesters but did not consider the month dummies, in addition to a model that uses a semester variable without making a distinction between the first and second plus a month dummy. These models were not presented in Table 5 to maintain parsimony.

The sign of the coefficients on the last day of a calendar period should be positive if managers try to inflate fund share prices at this time. The sign of the coefficients of the variables marking the beginning of the following calendar period should be negative if managers immediately reverse the transactions used to inflate share prices. The results in Table 5 indicate that abnormal returns on the day after the period end show statistical significance more frequently than those on period end dates. This suggests that there is a price reversal after the end of calendar months or semesters. There are a slightly smaller number of significant abnormal returns among value weighted fund portfolios, suggesting that this may be more frequent with smaller funds. In most cases, the absolute value of the coefficient estimated for the dummy marking the period beginning is greater than that of the period end, indicating that the strategy of trying to inflate share prices harms investors.

The number of significant coefficients for discontinued funds (4) is smaller than for funds in operation (6), even though the number of significant coefficients for beginning of the period dates is the same for the two kinds. The coefficients at the end of periods are not significant for discontinued funds and are smaller than those of operating funds. Thus, if managers attempt to inflate fund share prices, they seem to have caused more harm to investors in discontinued funds. Yet, the behavior of discontinued and operating funds is similar.

The number of significant coefficients for operating exclusive funds (5) is smaller than for non-exclusive operating funds targeting either qualified investors (6) or the general public (7). These findings indicate that qualified investors, particularly those with exclusive funds, may suffer less from agency conflicts than the general public.

The number of significant coefficients for portfolios of operating funds that charge an incentive fee (7) suggests that managers try to inflate their share price at period ends because the number of significant coefficients for portfolios of operating funds that charge only a management fee (6) and, particularly, no fee (4) are smaller.

These results are consistent with those in Sanematsu (2013), even though he did not compare discontinued and operating funds, did not distinguish among exclusive and non-exclusive funds for qualified investors, did not consider funds that do not charge a fee, and included very small funds. Survivorship bias is possibly not a problem for the results in Sanematsu (2013) and in most of Table 5. Managers of stock funds that charge incentive fees or that target the general public may be more prone to fund share price inflation at period ends.

Table 5 – Models with stock fund portfolio abnormal returns as the dependent variable and selected calendar days

Models	ALL	OPER	DISC	EXCL	QUAL	GEN	MAN	INC	NOFEE
END	0.08	0.11	0.02	0.10	0.11	0.13	0.10	0.15	0.08
t	1.92+	2.56*	0.49	1.94+	2.24*	3.60*	2.43*	3.37*	1.65+
BEG	-0.19	-0.19	-0.17	-0.22	-0.22	-0.14	-0.17	-0.20	-0.19
t	-3.62*	-3.48*	-3.39*	-3.46*	-3.21*	-3.29*	-3.48*	-3.49*	-3.10*
R^2 (%)	0.80	0.88	0.54	0.57	0.68	1.10	0.71	1.04	0.57
SEND	0.04	0.07	0.00	0.07	0.07	0.12	0.11	0.11	0.03
t	0.47	0.78	0.01	0.52	0.62	1.56	1.05	1.09	0.28
SBEG	-0.32	-0.33	-0.25	-0.41	-0.44	-0.28	-0.30	-0.40	-0.37
t	-2.39*	-2.34*	-2.08*	-2.72*	-2.56*	-2.21*	-2.27*	-2.60*	-2.44*
R^2 (%)	0.29	0.32	0.15	0.26	0.36	0.40	0.26	0.44	0.29
S1END	0.00	0.04	-0.07	0.09	0.07	0.07	0.12	0.07	0.00
t	0.01	0.20	-0.43	0.38	0.30	0.50	0.61	0.38	0.02
S2END	0.08	0.11	0.06	0.03	0.08	0.17	0.10	0.14	0.05
t	1.50	1.74+	1.47	0.41	1.04	3.51*	1.44	2.54*	0.71
S1BEG	-0.51	-0.53	-0.45	-0.57	-0.66	-0.47	-0.49	-0.60	-0.59
t	-2.34*	-2.26*	-2.29*	-2.32*	-2.36*	-2.29*	-2.26*	-2.35*	-2.47*
S2BEG	-0.11	-0.11	-0.05	-0.24	-0.20	-0.06	-0.09	-0.17	-0.13
t	-1.07	-1.07	-0.50	-1.65+	-1.33	-0.67	-0.91	-1.55	-0.94
MEND	0.09	0.12	0.02	0.11	0.12	0.13	0.10	0.16	0.09
t	1.90+	2.48*	0.55	1.93+	2.19*	3.29*	2.22*	3.22*	1.69+
MBEG	-0.16	-0.16	-0.16	-0.18	-0.17	-0.11	-0.15	-0.16	-0.15
t	-2.89*	-2.75*	-2.79*	-2.61*	-2.36*	-2.58*	-2.78*	-2.64*	-2.30*
R^2 (%)	0.86	0.96	0.57	0.54	0.76	1.29	0.74	0.66	0.66

Note. All variables and definitions of stock fund portfolios in top row in the Appendix. Coefficients are in percentage terms, i.e. a 1.0 coefficient represents an abnormal return of 1.0 percent. All stock fund portfolios are equally weighed. The value below the coefficients is the t-statistic computed with White robust standard errors. Abnormal returns for new and surviving funds relative to the Ibovespa index in the January 2004 through February 2013 period. * and + indicate significance at the five and ten percent levels, respectively.

Table 6 shows the results for portfolios of funds currently in operation according to combinations of fee and clientele types. It suggests that agency conflicts may be more frequent in funds that target the general public and also charge an incentive fee because they exhibit the largest number of statistically significant abnormal return coefficients. In general, the spread between the end of a period and the next day coefficients are larger for these kinds of funds. Contrastingly, exclusive funds and those that do not charge fees exhibit the lowest number of statistically significant coefficients. Table 6, thus, confirms the results in Table 5 and is consistent with those in Sanematsu (2013) with only four combinations of fee and clientele types. As a final remark, having a stricter regulation to charge incentive fees in funds targeting the general public may protect investors, even though it will not eliminate agency problems.

Table 6 - Models with stock fund portfolio abnormal returns according to fee type jointly with clientele as the dependent variable and selected calendar days

		MAN			INC			NOFEE	
Models	EXCL	QUAL	GEN	EXCL	QUAL	GEN	EXCL	QUAL	GEN
END	0.12	0.08	0.10	0.09	0.16	0.17	-0.05	0.06	0.14
t	2.26*	1.85+	2.75*	1.94+	2.44*	4.44*	-0.47	1.38	3.42*
BEG	-0.19	-0.15	-0.14	-0.23	-0.32	-0.15	-0.43	-0.14	-0.14
t	-2.91*	-2.76*	-3.26*	-3.57*	-3.56*	-3.13*	-3.44*	-2.37*	-3.07*
R^2 (%)	0.35	0.51	0.86	0.83	0.83	1.24	0.48	0.17	1.09
SEND	0.12	0.05	0.09	-0.01	0.10	0.16	-0.26	0.04	0.12
t	0.88	0.42	1.17	-0.05	0.75	2.12*	-1.16	0.36	1.31
SBEG	-0.39	-0.31	-0.24	-0.42	-0.59	-0.32	-0.73	-0.35	-0.27
t	-2.65*	-2.21*	-2.04*	-2.94*	-2.63*	-2.27*	-2.54*	-2.57*	-2.24*
R^2 (%)	0.17	0.25	0.29	0.38	0.37	0.47	0.24	0.14	0.39
S1END	0.20	0.01	0.03	-0.05	0.09	0.12	-0.39	0.08	0.09
t	0.74	0.06	0.20	-0.24	0.34	0.86	-0.98	0.39	0.51
S2END	0.05	0.08	0.16	0.03	0.11	0.21	-0.16	0.00	0.16
t	0.58	0.96	3.06*	0.39	1.57	3.97*	-0.82	0.00	2.54*
S1BEG	-0.55	-0.55	-0.41	-0.58	-0.76	-0.53	-0.86	-0.57	-0.51
t	-2.35*	-2.54*	-2.11*	-2.53*	-2.05*	-2.30*	-1.92+	-2.76*	-2.84*
S2BEG	-0.21	-0.04	-0.05	-0.24	-0.41	-0.07	-0.61	-0.11	-0.01
t	-1.45	-0.35	-0.59	-1.79+	-1.85+	-0.82	-1.81+	-0.82	-0.07
MEND	0.12	0.09	0.10	0.12	0.17	0.17	-0.00	0.07	0.14
t	2.13*	1.87+	2.52*	2.18*	2.36*	3.98*	-0.02	1.37	3.17*
MBEG	-0.14	-0.12	-0.11	-0.18	-0.26	-0.11	-0.36	-0.10	-0.11
t	-2.06*	-2.03*	-2.64*	-2.67*	-2.72*	-2.35*	-2.66*	-1.51	-2.33*
R^2 (%)	0.30	0.68	0.97	0.89	0.81	1.47	0.42	0.20	1.38

Note. All variables and definitions of stock fund portfolios in top two rows in the Appendix. Column MAN/EXCL, for example, is an equally weighed portfolio of fund that belong to both the MAN and EXCL portfolios, i.e., includes exclusive portfolios that only charge a management fee. The portfolios in the other columns follow the same logic. Coefficients are in percentage terms, i.e. a 1.0 coefficient represents an abnormal return of 1.0 percent. All stock fund portfolios are equally weighed. The value below the coefficients is the t-statistic computed with White robust standard errors. Abnormal returns for new and surviving fudns relative to the Ibovespa index in the January 2004 through February 2013 period. * and + indicate significance at the five and ten percent levels, respectively.

4.4 Influence of mark-to-market regulation change

The mark-to-market criterion for stock funds changed in May 2008. The new rule requires that the value of assets in the fund portfolio shall be determined with the closing market price instead of a trading volume-weighted average price. Maybe inflating the closing price of stock, particularly less liquid ones, is easier, leading to more fund price inflation attempts to improve performance or increase incentive fees.

A new binary variable is equal to 1 in all days after the rule change and zero otherwise. The models in Table 5 were estimated again with the interactions between this new variable and the END and BEG dummies. Table 7 portrays the results for two of the models in Table 5. The first one includes dummies for the beginning and end of every month (BEG and END) plus their interactions with the dummy for the days before and after the rule change. The second model distinguishes between the first and second semesters, includes dummies for the other months of the year, plus the same interacted variables used in the previous model. One of the models in Table 5 was omitted to save space because its results were not very different from those of the other two models.

Table 7 indicates that the evidence in Table 5 changes with the inclusion of the interaction variables, even though the conclusions remain the same. The new interacted variables are more frequently significant than those originally used in the first model of Table 5. The magnitude and signs of the coefficients for the interacted variables are consistent with those in Table 5. There are more statistically significant coefficients when funds target the general public or charge an incentive fee, similarly to what was reported in Tables 5 and 6. The robustness checks performed for the main results in Table 5 have also been carried out for the models in Table 7 with the proportion of positive abnormal returns in lieu of the abnormal returns. The conclusions remained the same. To surmise, this indicates that the problem of fund share price inflation may have been accentuated by the adoption of the closing price as the mark-to-market criterion for stock funds. Even though there are more significant coefficients in this study, the conclusions are consistent with those in Sanematsu (2013).

Table 7 – Models with stock fund portfolio abnormal returns as the dependent variable and selected calendar days considering mark-to-market rule change

Models	ALL	OPER	DISC	EXCL	QUAL	GEN	MAN	INC	NOFEE
END	-0.2	0.02	-0.6	0.02	0.01	0.05	0.02	0.06	-0.03
to	-0.39	0.42	-1.16	0.30	0.11	1.04	0.49	1.25	-0.56
BEG	-0.10	-0.08	-0.11	-0.09	-0.11	-0.04	-0.06	-0.08	-0.08
to	-1.94+	-1.66+	-2.02*	-1.40	-1.89+	-1.11	-1.39	-1.64+	-1.85+
END*CL	0.19	0.17	0.15	0.15	0.20	0.16	0.15	0.17	0.21
to	2.41*	2.15*	1.96*	1.63	2.19*	2.33*	1.94+	2.06*	2.28*
BEG*CL	-0.18	-0.21	-0.11	-0.23	-0.20	-0.19	-0.21	-0.22	-0.20
to	-1.78+	-2.06*	-1.15	-1.98*	-1.58	-2.37*	-2.33*	-2.09*	-1.75+
R^2 (%)	1.06	1.16	0.64	0.71	0.85	1.50	0.97	1.31	0.80
S1END	-0.11	-0.06	-0.16	0.01	-0.05	-0.01	0.04	-0.03	-0.11
to	-0.63	-0.35	-0.94	0.03	-0.22	-0.10	0.20	-0.15	-0.57
S2END	-0.02	0.01	-0.02	-0.05	-0.04	0.08	0.01	0.05	-0.06
to	-0.27	0.15	-0.29	-0.47	-0.37	1.21	0.15	0.58	-0.62
S1BEG	-0.42	-0.42	-0.39	-0.45	-0.56	-0.37	-0.38	-0.49	-0.49
to	-2.16*	-2.06*	-2.15*	-2.08*	-2.21*	-2.09*	-2.02*	-2.17*	-2.30*
S2BEG	-0.01	0.00	0.01	-0.11	-0.09	0.05	0.03	-0.04	-0.02
to	-0.11	0.03	0.12	-0.65	-0.53	0.57	0.27	-0.38	-0.13
MEND	-0.01	0.03	-0.05	0.02	0.01	0.05	0.02	0.07	-0.02
to	-0.20	0.54	-0.99	0.39	0.26	1.00	0.43	1.31	-0.32
MBEG	-0.07	-0.04	-0.09	-0.05	-0.06	-0.01	-0.03	-0.04	-0.04
to	-1.15	-0.81	-1.46	-0.69	-0.88	-0.27	-0.62	-0.63	-0.78
END*CL	0.19	0.17	0.15	0.16	0.21	0.16	0.15	0.17	0.21
to	2.42*	2.16*	1.98*	1.65+	2.20*	2.34*	1.95+	2.08*	2.30*
BEG*CL	-0.18	-0.21	-0.12	-0.24	-0.21	-0.19	-0.22	-0.23	-0.20
to	-1.84+	-2.13*	-1.20	-2.03	-1.64+	-2.47*	-2.40*	-2.17*	-1.82+
R^2 (%)	1.13	1.26	0.67	0.69	0.94	1.70	1.01	1.46	0.90

Note. All variables and definitions of stock fund portfolios in top row in the Appendix. Coefficients are in percentage terms, i.e. a 1.0 coefficient represents an abnormal return of 1.0 percent. All stock fund portfolios are equally weighed. The value below the coefficients is the t-statistic computed with White robust standard errors. Abnormal returns relative to the Ibovespa index in the January 2004 through February 2013 period. * and + indicate significance at the five and ten percent levels, respectively.

4.5 Robustness checks

Carhart *et al*. (2002) also tested abnormal US stock fund returns using as dependent variable the proportion of funds in each category that exhibit positive abnormal returns. This study executed these tests as well and obtained similar conclusions to those presented in the preceding section. The proportion of funds with positive abnormal returns is larger at the end of a period and smaller at the beginning of a period. These proportions of positive abnormal returns are more frequently significant at period ends when funds charge incentive fees and target the general public.

Additional tests used dummies for two or three days before the last trading day of a calendar period instead of the last day dummy. Analogously, dummies for one, two or three days after the first trading day of a period were used instead of the first trading day dummy. The negative and significant abnormal returns on the period ending days and the positive and significant returns in the next period beginning days were not observed. Thus, the evidence for the last trading day of a period and the first trading day of the next period

does not seem to extend to the preceding or following trading days, respectively. These robustness tests are not presented herein but are available with the authors.

The period end considered in the previous analyses was the last trading day in the calendar period. However, many funds do not charge incentive fees on these days. In fact, 23 of the 203 stock funds that charge incentive fees in the sample levy them every six months but on dates that do not coincide with the end of the calendar semester. Twelve funds charge the incentive fee once a year and two of them do not use the last day of the calendar to calculate the fee. One of the funds charges its incentive fee on a quarterly basis and two charge this fee monthly on the last trading day of the month. Thus 165 of the 203 funds (81 percent) charge an incentive fee every six months at the end of each calendar semester. Maybe the models that considered solely calendar semester-ends in Tables 5 and 6 did not capture the fund price share inflation properly.

Table 8 presents descriptive statistics for abnormal returns and their positive proportion. The Appendix shows the definitions of the FEEDAY and AFTERFEE dummy variables. FEEDAY marks the day in which a fund charges incentive fees or the last day of a calendar semester for funds that do not charge an incentive fee. AFTERFEE marks the corresponding trading day after those marked by FEEDAY. Like the preceding evidence, the abnormal return for FEEDAY should be positive if fund managers try to inflate the fund share price. The abnormal returns for AFTERFEE, on the other hand, should be negative if fund managers need to reverse the positions taken to inflate the price of fund shares on the previous day.

The FEEDAY average abnormal return is 6.0 basis points for all funds, 6.9 for operating, and 3.0 for discontinued funds in Panel A of Table 8. The abnormal return averages for the other days are 2.0, 3.0, and 0.02 basis points for all, operating, and discontinued funds, respectively. These averages for the other days are not in Table 8. The differences between average abnormal returns on AFTERFEE days and other days are significant for every fund portfolio. However, this is not always the case for the FEEDAY dummy. The absolute values of the average and median abnormal returns for FEEDAY are much lower than those for AFTERFEE. This suggests that attempts to inflate the fund share prices at FEEDAY may cost investors dearly.

The proportion of positive abnormal returns is around 50 percent on the other days in the sample (those not market in FEEDAY or AFTERFEE). The proportion of positive abnormal returns for every fund portfolio is greater than 50 percent for FEEDAY in Panel A of Table 8. Exclusive funds (EXCL) register the lowest proportion of positive abnormal returns as well as the lowest average abnormal return for FEEDAY. Funds that target the general public (GEN) display the largest proportion of positive abnormal returns as well as

the highest average abnormal returns for FEEDAY, which is significantly greater than that of other trading days.

This evidence confirms the previous conclusions that funds aimed at the general public may be more exposed to agency conflicts and that investors of exclusive funds are less exposed to this problem. The results for funds that charge incentive fees are consistent with previous conclusions as well. Even though the evidence in Panel A of Table 8 provides more information and statistical significance test than Sanematsu (2013), the conclusions herein are in line with those of that study.

Table 8 - Abnormal returns on actual incentive fee charge day

Panel A: Whole sample period (January 2004 through February 2013)

Portfolio	Day dummy	Average	Median	Prop. > 0	No. Obs.	t(1)
ALL	FEEDAY	6.0	8.2	58.3	7503	3.6*
OPER	FEEDAY	6.9	9.1	58.1	5695	3.3*
DISC	FEEDAY	3.0	6.7	59.0	1808	1.5
EXCL	FEEDAY	2.8	5.3	53.7	2186	-0.1
QUAL	FEEDAY	6.4	10.5	59.0	982	0.7
GEN	FEEDAY	10.7	10.4	61.6	2527	5.7*
MAN	FEEDAY	6.1	8.3	58.6	2987	2.2*
INC	FEEDAY	9.4	10.3	57.8	2014	2.9*
NOFEE	FEEDAY	3.2	7.4	56.9	694	-0.4
ALL	AFTERFEE	-42.5	-25.0	33.5	7504	-35.1*
OPER	AFTERFEE	-49.4	-33.2	30.4	5694	-37.0*
DISC	AFTERFEE	-20.7	-7.1	43.3	1810	-7.5*
EXCL	AFTERFEE	-57.3	-46.0	27.0	2187	-23.9*
QUAL	AFTERFEE	-56.3	-41.0	29.7	980	-16.5*
GEN	AFTERFEE	-39.9	-21.1	33.6	2527	-23.2*
MAN	AFTERFEE	-45.1	-28.2	31.5	2989	-25.5*
INC	AFTERFEE	-53.3	-39.1	29.3	2011	-22.6*
NOFEE	AFTERFEE	-56.7	-38.2	28.7	694	-14.5*

Panel B: Period before the mark-to-market rule change (until May 2008)

Portfolio	Day dummy	Average	Median	Prop. > 0	No. Obs.	t(1)
ALL	FEEDAY	5.3	6.7	59.0	1968	3.2*
OPER	FEEDAY	11.0	9.1	61.6	1132	4.8*
DISC	FEEDAY	-2.5	3.8	55.5	836	-0.6
EXCL	FEEDAY	13.0	8.1	55.3	291	2.2*
QUAL	FEEDAY	12.0	8.7	62.2	193	2.5*
GEN	FEEDAY	9.8	10.1	64.2	648	3.8*
MAN	FEEDAY	14.0	11.0	64.4	592	3.8*
INC	FEEDAY	9.1	7.7	57.0	428	3.1*
NOFEE	FEEDAY	2.2	11.2	64.3	112	0.3
ALL	AFTERFEE	-2.4	0.8	50.8	1965	-1.5
OPER	AFTERFEE	-1.5	0.6	50.4	1129	-1.0
DISC	AFTERFEE	-3.7	1.8	51.4	836	-1.1
EXCL	AFTERFEE	-8.5	-7.3	45.5	292	-1.5
QUAL	AFTERFEE	-3.4	0.9	50.8	191	-1.0
GEN	AFTERFEE	2.2	2.6	52.5	646	0.9
MAN	AFTERFEE	2.2	3.1	52.6	593	0.8
INC	AFTERFEE	-5.9	-3.4	45.8	424	-2.4*
NOFEE	AFTERFEE	-4.0	8.7	56.3	112	-0.9

Panel C: Period after the mark-to-market rule change (after May 2008)

Portfolio	Day dummy	Average	Median	Prop. > 0	No. Obs.	t(1)	t(2)
ALL	FEEDAY	6.2	9.4	58.1	5535	2.5*	0.5
OPER	FEEDAY	5.9	9.1	57.3	4563	1.6	-1.9+
DISC	FEEDAY	7.7	10.9	61.9	972	2.5*	2.7*
EXCL	FEEDAY	1.2	5.0	53.5	1895	-1.0	-1.8+
QUAL	FEEDAY	5.1	11.4	58.2	789	0.0	-1.2
GEN	FEEDAY	11.0	10.4	60.7	1879	4.5*	0.4
MAN	FEEDAY	4.1	7.7	57.2	2395	0.	-2.4*
INC	FEEDAY	9.5	12.0	58.0	1586	2.2*	0.1
NOFEE	FEEDAY	3.4	7.0	55.5	582	-0.5	0.2
ALL	AFTERFEE	-56.7	-40.8	27.3	5539	-37.4*	-25.0*
OPER	AFTERFEE	-61.3	-47.7	25.4	4565	-39.0*	-24.6*
DISC	AFTERFEE	-35.3	-16.6	36.2	974	-7.8*	-6.0*
EXCL	AFTERFEE	-64.9	-54.6	24.2	1895	-24.8*	-9.6*
QUAL	AFTERFEE	-69.1	-56.3	24.6	789	-17.2*	-11.1*
GEN	AFTERFEE	-54.4	-37.5	27.1	1881	-25.1*	-20.2*
MAN	AFTERFEE	-56.8	-42.0	26.3	2396	-27.6*	-17.5*
INC	AFTERFEE	-66.0	-52.1	24.9	1587	-23.3*	-15.0*
NOFEE	AFTERFEE	-66.9	-49.1	23.4	582	-15.1*	-8.5*

Note. Average and median values are in basis points, i.e. 1.0 represents 0.01 percent or one basis point. All portfolios are equally weighted. Proportions of positive abnormal returns ("Prop. > 0") are in percentage form. Abnormal returns are taken relative to the Ibovespa index. Portfolios and day dummies are defined in the Appendix. The t-statistic (1) is for the difference between the average abnormal return for a portfolio on FEEDAY or AFTERFEE trading days and the average abnormal returns on the other trading days of the sample. The t-statistic (2) in Panel C is for the difference between the average abnormal returns in Panel C (after the rule change) and in Panel B (before the rule change). * and + indicate significance at the five and ten percent levels, respectively.

Panels B and C of Table 8 present descriptive statistics for stock funds abnormal returns similar to those in Panel A. Panel B shows the results for the period when mark-to-market was performed using the average price and Panel C from the month the closing price should be used.

The FEEDAY abnormal returns are more often significantly greater than those in the other days before the rule change. The average abnormal returns for portfolios of funds that target the general public or charge incentive fees are significantly greater for FEEDAY than in other days both before and after the rule change. The FEEDAY abnormal returns are significantly greater for discontinued funds after the rule change while funds that do not charge an incentive fee displayed a significant reduction in abnormal returns.

There is a remarkable difference between the AFTERFEE returns before and after the rule change. Average and median daily abnormal returns are significantly different and greater in absolute terms after the adoption of the closing price rule for all portfolios. This result for the day after the incentive fee was charged suggests that fund share price inflation attempts may have accentuated after the introduction of the new rule, maybe

through more risk taking or trading in less liquid stocks, and the reversals of these attempts may have caused more severe losses to investors.

The evidence in Panels B and C of Table 8 indicate that attempts to inflate the share price of the fund on the last day of the period have not been curbed with the rule change. Inflation attempts did not generate better returns for managers at period ends after the rule change, but investors were worse off because the negative abnormal returns on the following day increased in absolute terms after the adoption of the closing price rule.

5 – CONCLUSIONS

Disregarding discontinued funds may lead to overestimation of the average stock fund performance. The equally weighted average annual return of surviving Brazilian stock funds is nearly two percentage points greater than a sample with surviving and discontinued funds between January 2004 and February 2013. This figure drops to little over one percent for the AUM weighted average stock fund return, suggesting that the AUM of discontinued stock funds was smaller. The difference in performance, nonetheless, was not statistically significant in every sample year. This suggests that other factors may inhibit performance besides survivorship, such as fund longevity and association to large financial conglomerates that predominantly cater to the general banking clientele. Mendonça *et al*. (2016) argue that younger funds or those run by independent asset managers that target qualified investors tend to perform better.

Brazilian stock funds do not seem to be immune to agency conflicts, but this may be attenuated when investors have a greater capacity to monitor fund managers. Stock funds that target the general public exhibit a greater incidence of abnormal returns around the end of calendar months or semesters than exclusive funds and non-exclusive funds for qualified investors. It is possible that fund managers try to inflate the share price of funds particularly on the days they charge fees. This evidence is consistent with the findings in Sanematsu (2013).

The charge of incentive fees may encourage fund managers to try to inflate the price of fund shares in order to obtain a larger compensation. There is a greater frequency in the occurrence of significant abnormal returns for funds that charge an incentive fee. The incidence of significant abnormal returns is even greater for stock funds that target the general public and charge an incentive fee. This evidence is consistent with the conjecture that the deleterious effects of agency conflicts may be more severe in stock funds that charge more for management compensation and are monitored by investors from the

general public. A stricter regulation for the charge of incentive fees in funds that target the general public may help protecting these investors but will not eliminate the practice of inflating fund share prices entirely.

The introduction of the closing price instead of the average price as the fund mark-to-market criterion in May 2008 may have accentuated the problem. The results indicate that the problem is more serious on the day following the end of the period, when negative abnormal returns increased in absolute terms after the adoption of the closing price. Even so the results do not show conclusively that the practice of inflating fund share prices became more widespread with the adoption of the new mark-to-market criterion, investor losses on the day after the end of the period increased substantially after the adoption of the closing price rule, since managers may need to reverse the transactions that tried to inflate the fund share price on the previous day. In general, the conclusions herein support those in Sanematsu (2013), who did not consider all the information about discontinued funds, did not distinguish between exclusive and non-exclusive funds, and included very small funds for a slightly shorter sample period.

A limitation of this study is that it was not possible to analyze discontinued funds in terms of their clientele or fee types. Only historical daily fund share prices and net asset values were available for these funds. This study could not examine daily portfolio composition on dates close to period ends. The Brazilian Securities Commission has portfolio composition data solely for the last trading day of the month. Maybe it would be possible to ascertain whether the goal of fund trades on the last days of a period was to inflate fund share prices temporarily if daily portfolio compositions were available. This study does not examine stock data on the last days of periods and on subsequent days, such as prices, trading volume, institutional shareholding, among others. The analysis of this data may be explored in future studies to improve the understanding of fund abnormal returns at period ends.

6 – REFERENCES

BROWN, K. C.; HARLOW, W. V.; Starks, L. T. Of tournaments and temptations: an analysis of managerial incentives in the mutual fund industry. **Journal of Finance**, v. 51, n. 1, p. 85–110, 1996.

BROWN, S. J.; GOETZMANN, W. N. Performance persistence. **The Journal of Finance**, v. 50, n. 2, p. 679–698, 1995.

CARHART, M. M. On persistence in mutual fund performance. **Journal of Finance**, v. 52, n. 1, p. 57–82, 1997.

CARHART, M. M. et al. Leaning for the tape: evidence of gaming behavior in equity mutual funds. **Journal of Finance**, v. 57, n. 2, p. 661–693, 2002.

CASTRO, B. R.; MINARDI, A. M. A. F. Comparação do desempenho dos fundos de ações ativos e passivos. **Revista Brasileira de Finanças**, v. 7, n. 2, p. 143–161, 2009.

COMERTON-FORDE, C.; PUTNINS, T. J. Measuring closing price manipulation. **Journal of Financial Intermediation**, v. 20, n. 2, p. 135–158, 2011.

ELTON, E. J.; GRUBER, M. J.; BLAKE, C. R. Survivorship bias and mutual fund performance. **The Review of Financial Studies**, v. 9, n. 4, p. 1097–1120, 1996.

GALLAGHER, D. R.; GARDNER, P.; SWAN, P. L. Portfolio pumping: an examination of investment manager quarter-end trading and impact on performance. **Pacific-Basin Finance Journal**, v. 17, n. 1, p. 1–27, 2009.

GRINBLATT, M.; TITMAN, S. Mutual fund performance - an analysis of quarterly portfolio holdings. **Journal of Business**, v. 62, n. 3, p. 393–416, 1989.

HUANG, J.; SIALM, C.; ZHANG, H. J. Risk shifting and mutual fund performance. **Review of Financial Studies**, v. 24, n. 8, p. 2575–2616, 2011.

MALKIEL, B. G. Returns from investing in equity mutual funds 1971 to 1991. **The Journal of Finance**, v. 50, n. 2, p. 549–572, 1995.

MATOS, P. R. F.; PENA, C. M.; SILVA, A. B. G. Fundos mútuos de investimento em ações no Brasil: incentivos, gestão e convergência. **Brazilian Business Review**, v. 12, n. 2, p. 115-147, 2015.

MENDONÇA JUNIOR, J. A. et al. **Stock fund selection and the individual investor**. Instituto COPPEAD de Administração, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 2016. Relatório Técnico.

ROQUETE, R. M. et al. O problema de agência aplicado aos fundos de investimento multimercados. **Revista de Finanças Aplicadas**, n. 7, n. 1, p. 1-21, 2016.

SANEMATSU, F. C. Remuneração dos gestores, público alvo e conflitos de interesse em fundos de ações no Brasil. **Economia Aplicada**, n. 17, n. 3, p. 267-298, jul./set. 2013.

WARNER, J. B.; WU, J. S. Why do mutual fund advisory contracts change? performance, growth, and spillover effects. **Journal of Finance**, v. 66, n. 1, p. 271- 306, 2011.

APPENDIX
Variable definitions

Variable	Definition
S1END (S1BEG)	Equal to 1 on the last (first) trading day of the first semester of the calendar year and 0 otherwise.
S2END (S2BEG)	Equal to 1 on the last (first) trading day of the second semester of the calendar year and 0 otherwise.
SEND (SBEG)	Equal to 1 on the last (first) trading day of a semester of the calendar year and 0 otherwise.
MEND (MBEG)	Equal to 1 on the last (first) trading day of the months that are not semester ends (beginnings) in the calendar year and 0 otherwise.
END (BEG)	Equal to 1 on the last (first) trading day of any month in the calendar year and 0 otherwise.
FEEDAY (AFTERFEE)	Equal to 1 on the day (day after) a fund computed the incentive fee or equal to 1 on the last (first) trading day of a semester of the calendar year for funds that do not charge incentive fees and 0 otherwise.
END*CL (BEG*CL)	Interaction between the binary variable END (BEG) with a binary variable that is equal to 1 for every day in the period after the mark-to-market rule change and zero otherwise.
ALL	Portfolio of stock funds with all stock funds in the sample, including operating and discontinued funds, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)
OPER	Portfolio of stock funds in operation at the end of the sample period, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)
DISC	Portfolio of stock funds discontinued during the sample period, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)
MAN	Portfolio of stock funds in operation at the end of the sample period that only charge a management fee, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)
INC	Portfolio of stock funds in operation at the end of the sample period that charge a management and an incentive fee, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)
NOFEE	Portfolio of stock funds in operation at the end of the sample period that do not charge fees, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)
EXCL	Portfolio of exclusive stock funds in operation at the end of the sample period, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)
QUAL	Portfolio of non-exclusive stock funds in operation targeted to qualified investors at the end of the sample period, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)
GEN	Portfolio of non-exclusive stock funds in operation targeted to the general public at the end of the sample period, except very small funds (those whose AUM was less than US$ 5 million throughout the sample period)

Rua Pascoal Lemme, 355 Ilha do Fundão Rio de Janeiro - RJ CEP:21941-918 Caixa Postal 68514 21941-972
Tel:2598-9898 Fax:2598-9848 e-mail:atendimento@coppead.ufrj.br Home Page:www.coppead.ufrj.br